

Annual Report to the Twenty-Second Legislature
Regular Session of 2004

NORTH SHORE PAUKAULA STREAMBANK EROSION
AND RIPARIAN AREA COMMUNITY PROJECT



Prepared by the
Department of Land and Natural Resources
State of Hawaii
in response to
Senate Concurrent Resolution 223, Senate Draft 1,
Regular Session of 1995
December 2003

Fiscal Year 2002-2003
Annual Report on North Shore Paukauila Streambank Erosion
& Riparian Area Community Restoration Project

This annual report is prepared pursuant to Senate Concurrent Resolution 223, Senate Draft 1, Regular Session of 1995, and covers the period July 1, 2002 through June 30, 2003.

This concurrent resolution requests the Department of Land and Natural Resources Flood Control Section to assist the Paukauila Streambank and Riparian Area Community Restoration Project by providing information, expertise, and support in their efforts to coordinate and maintain the Paukauila Streambank, and to report its findings and accomplishments to the Legislature on a yearly basis.

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1.0 INTRODUCTION

Senate Concurrent Resolution (SCR) No. 223, Senate Draft (SD) 1 of the Eighteenth Legislature, 1995 (See Appendix A) requested that the Department of Land and Natural Resources (DLNR) coordinate with the Paukauila Streambank and Riparian Area Community Restoration Project (PSP) by providing information, expertise, and support; and to coordinate with the City and County of Honolulu, Department of Public Works; Department of Health Environmental Planning Office and Clean Water Branch; the United States Army Corps of Engineers, and the United States Department of Agriculture, Natural Resources Conservation Service in conjunction with the West Oahu Soil and Water Conservation District to recommend a restoration plan and implement the recommendations.

The PSP Ad-hoc Committee did not formally meet as a group this past year to discuss the issues of hazard mitigation for the Paukauila Streambank and Riparian Area Community Restoration Project.

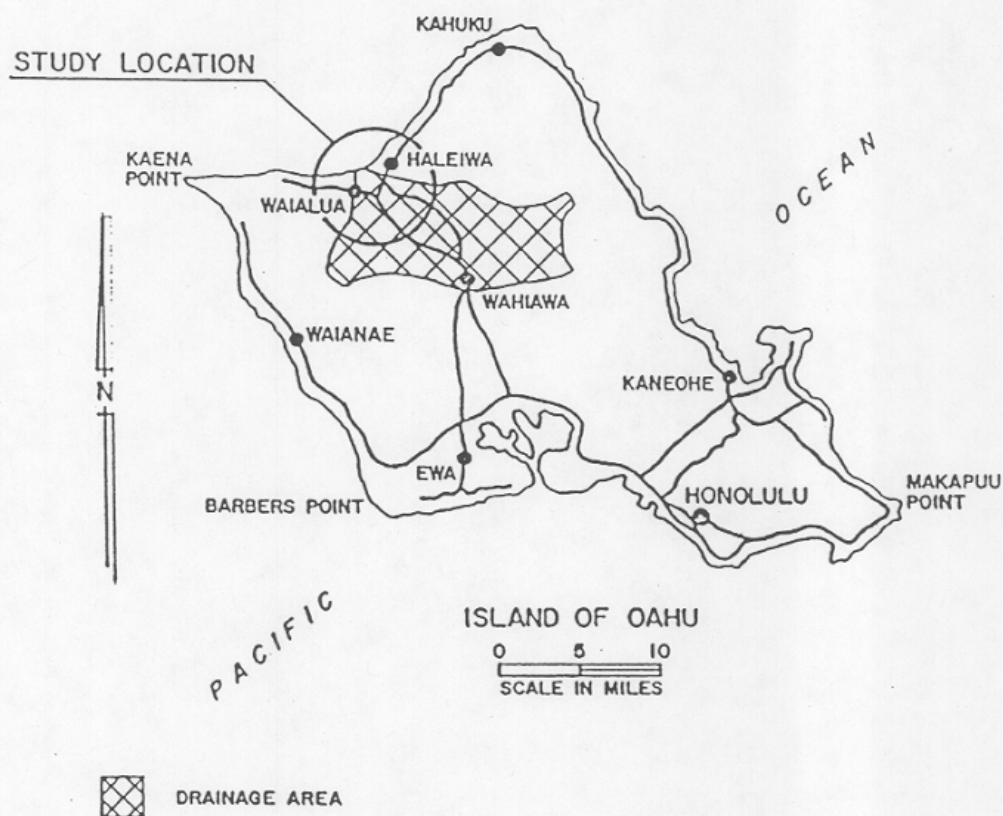
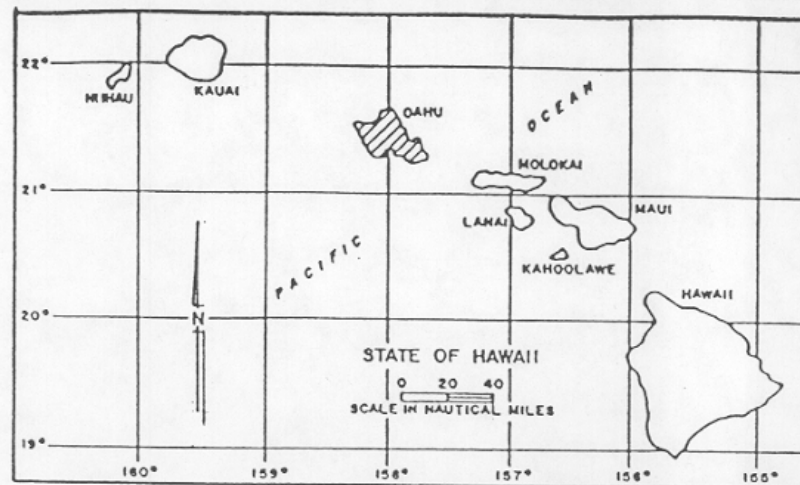
This report is to be regarded as general information in nature. It is not to be construed as approval by the State or other government agencies for specific proposed solutions and actions.

2.0 BACKGROUND AND FLOODING PROBLEM

2.1 Description

The Paukauila-Kiikii Stream drainage basin is the largest basin on the Island of Oahu (Figure 1). The basin ranges from approximately 2000 feet mean sea level (msl) at the crest of the Koolau Mountain Range to approximately 10" feet msl at Cane Haul Road Bridge. The Paukauila-Kiikii Stream and its tributary streams are located on the northwestern coast of Oahu (Figure 2). Paukauila and Kiikii Streams converge at Cane Haul Road Bridge just prior to discharging into Kaiaka Bay. Kiikii Stream has two main tributaries, Kaukonahua and Poamoho Streams. Tributaries to the Paukauila branch are Helemano and Opaepala Streams. Poamoho, Kaukonahua, Opaepala and Helemano Streams are typically perennial in the upper reaches, while the middle reaches are intermittent caused primarily by diversions for irrigation use. The stream waters are stored in more than 30 small reservoirs and a relatively large one (Wahiawa Reservoir with a 9,200 acre-foot capacity) along the tributaries. Since these reservoirs were constructed for irrigation purposes, they were not designed for flood control storage.

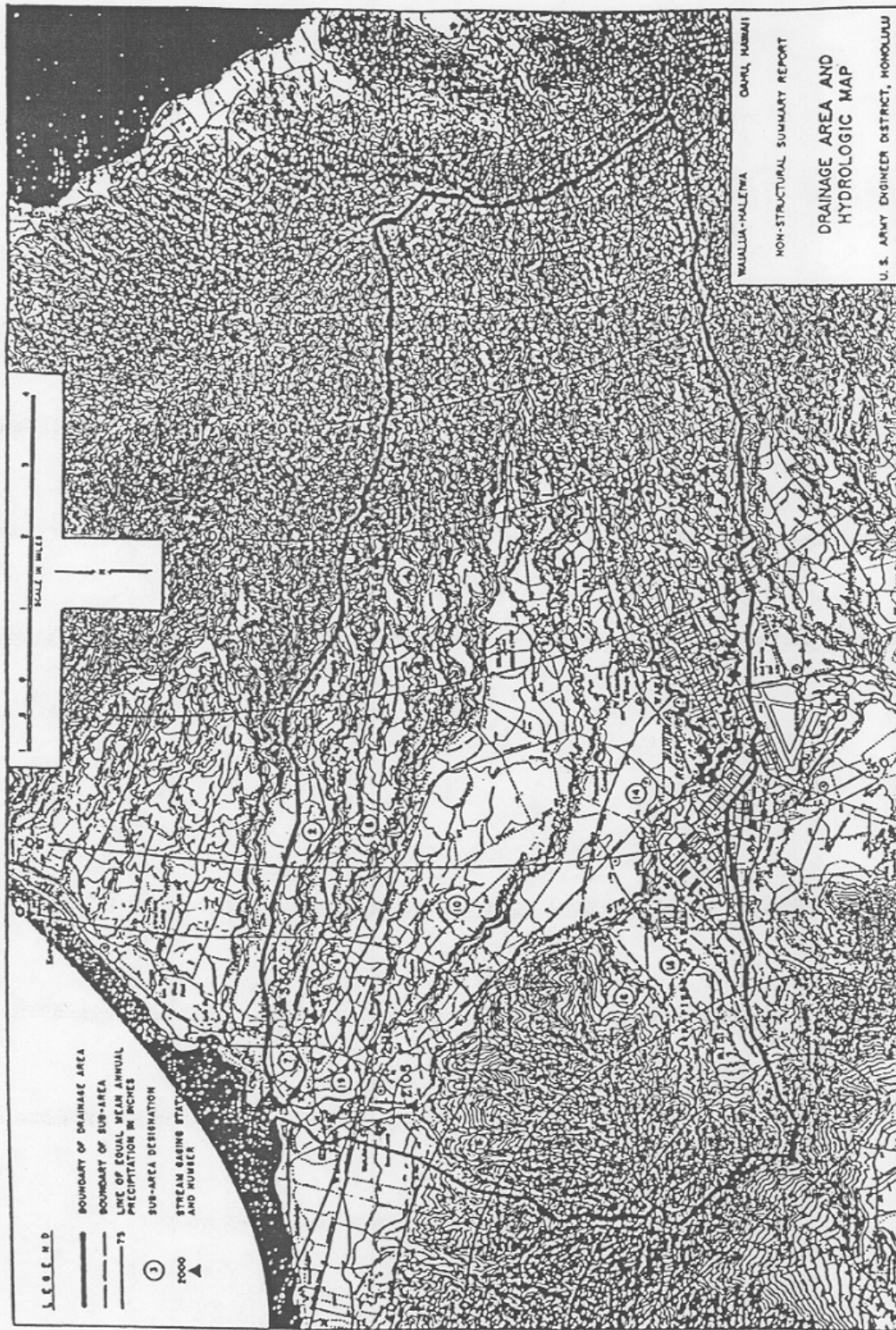
The main streams are under tidal influence up to their confluence with the



Source: *Non-Structural Summary Report for Flood Damage Reduction, WAIALUA-HALEIWA AREA, Oahu, Hawaii*, Department of the Army, U.S. Army Engineer District, Honolulu, September 1976.

Figure 1
Location Map

North Shore Paukauila Streambank Erosion
and Riparian Area Community Project
Prepared by: Department of Land and Natural Resources



Note: Drawing not to scale

Source: Non-Structural Summary Report for Flood Damage Reduction, WAIALUA-HALEIWA AREA, Oahu, Hawaii, Department of the Army, U.S. Army Engineer District, Honolulu, September 1976.

Figure 2
DRAINAGE MAP

North Shore Paukauila Streambank Erosion
and Riparian Area Community Project
Prepared by: Department of Land and Natural Resources

tributaries, and have a relatively gradual slope and low velocity flow during normal conditions.

2.2 Flood Problem

Most floods in Hawaii result from large scale storm systems and occur generally from November through May. However, flooding from intense local thunderstorms can occur any time. The basin topography and existing drainage way capacities are such that flooding in the Waialua-Haleiwa area is restricted entirely to the low-lying area between elevation 30 and the Pacific Ocean (Figure 3). Flooding is attributed primarily to the inadequate capacity of the existing streams, particularly Paukauila and Kiikii Streams. During high-peak discharges, flood waters overtop the streambanks, inundating the low-lying residential and agricultural lands. Erosion, sedimentation, and waterborne debris also compound the flood problem. Blockage of bridge openings by debris restricts flow, causing flood waters to back up and inundate low-lying areas.

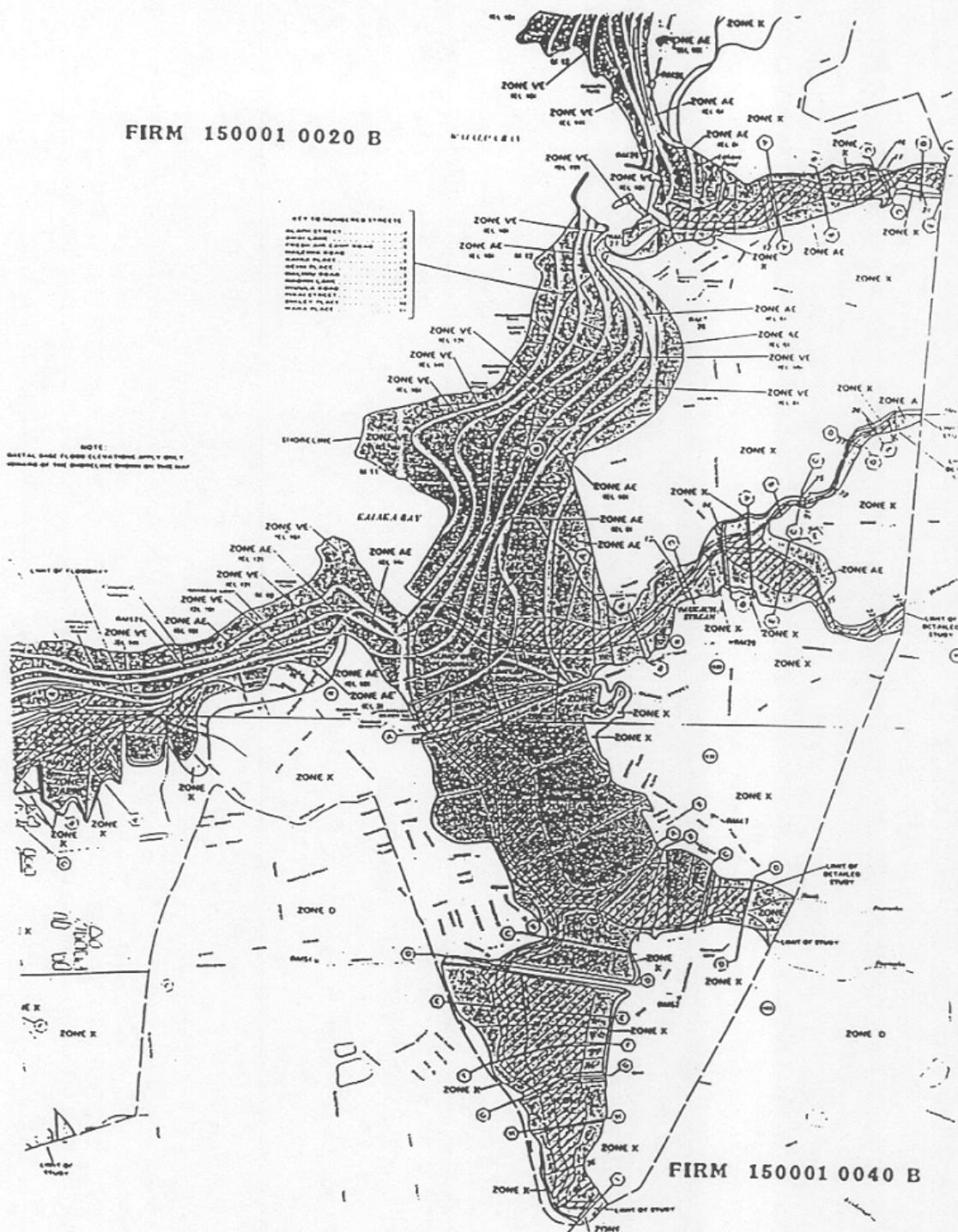
2.3 Flood History

The Waialua-Haleiwa area has been subjected to flooding from rainstorms, high waves, and tsunamis.

Flooding by Rainstorms. Rainstorm-generated floods have been the most common, widespread, and damaging of the three natural causes. Most rainstorm floods result from large-scale storm systems with intense rainfall generally occurring from November through May.

Flooding by High Waves. Shoreline surf flooding is caused by unusual storm conditions which produce high, wind-generated waves.

Flooding by Tsunami. Tsunamis, known as tidal waves, have also caused extensive flooding and damage along the coastal regions. Tsunamis are also referred to as “seismic sea waves” because of their association with earthquakes. Since 1819, at least 39 tsunamis are known to have reached the Hawaiian Islands.



Source: *Flood Insurance Rate Map, City and County of Honolulu, Hawaii*, Community Panel Number 150001 0020B and 150001 0040B, Federal Emergency Management Agency, September 4, 1987.

FLOOD INSURANCE RATE MAP

Prepared by: Department of Land and Natural Resources

3.0 DLNR'S PAST EFFORTS

The following are DLNR's past efforts to address the issue of flood control for the Waialua-Haleiwa area:

<u>Past Projects/Studies</u> (as reported in past legislative reports)	<u>Project Status</u>
Paukauila Stream Mouth Dredging Project, DLNR	Dredging completed.
Flood Plain Analysis of Proposed Stream Dredging at Paukauila Stream , U.S. Army Corps of Engineers (USACOE)	Analysis completed. Findings and recommendations are described in a November 1999 report (see below).
Flood Plain Analysis of Kaukonahua Stream, Island of Oahu, (USACOE)	Analysis completed.

4.0 RECOMMENDATIONS

Past projects and studies have determined that:

1. Otake Camp is in a flood zone and will be flooded by low frequency storms (storms > 5 years).
2. Federal participation is not warranted at this time due to benefit/cost ratio being less than one.
3. Federal funds are not available for property relocation, elevation or acquisition.

In order to re-involve Federal participation, the State needed to look at another approach to involve the USACOE to meet the benefit to cost ratio. Therefore, the State requested the USACOE to investigate the restoration of Kaiaka Bay (Waialua/Wahiawa watershed), Oahu, Hawaii under Section 206, Water Resources Development Act of 1996, Aquatic Ecosystem Restoration Projects Authority.

On August 30, 2002, the USACOE indicated that a Section 206 reconnaissance study of restoration opportunities in the Waialua/Wahiawa watershed would be initiated during federal fiscal year 2003. The study's federally-financed preliminary restoration plan will determine whether continued federal interest is warranted in the detailed feasibility phase.

The detailed feasibility phase will include looking at the entire watershed and determining whether continued Federal interest is warranted. Financing for the feasibility phase is 35% non-federal and 65% federal. Once federal interest is determined, a state appropriation will be needed for the detailed feasibility phase for project development to restore the ecosystem of Kaiaka Bay.

The State is doing the following:

- Working with Dole Foods, State Dept. of Health, and Division of Aquatics Resources to reduce the water level in Lake Wilson from 8 to 10 feet to provide additional storage capacity in the reservoir and reduce lower frequency storms from flooding Otake Camp.
- Kaukonahua Stream Dredging: The State has directed the consultant to take additional topographic surveys of the stream above the Cane Haul Road and do hydraulic and hydrologic analyses of the survey points to determine the existing carrying capacity of the stream above Otake Camp. This data will determine the final level to be lowered in Lake Wilson.
- Working with the U.S. Geological Survey (USGS) to install a flood warning system at Lake Wilson to provide advance warning of impending flooding to residents of Otake Camp. The State has requested \$50,000 to purchase stream and rain gages and to install them, and also requested an annual maintenance cost of \$ 25,000 to operate and maintain them.
- Work with the residents and owners of Kaukonahua Stream to develop a routine maintenance program for clearing channel debris and sediments. The plan should include field inspections after a major flood event.
- Work with the land owners to re-vegetate fallow lands. A major contributor of sedimentation into the streams are lands left vacant after sugar cane and pineapple went out of production. Grass and ground cover should be initiated to prevent erosion and sediments going into the streams.

5.0 REFERENCES

- C *Flood Plain Information-Waialua-Haleiwa, Oahu, Hawaii*, Department of the Army, Pacific Ocean Division, Corps of Engineers, Honolulu, Hawaii, November 1970.
- C *Non-Structural Summary Report for Flood Damage Reduction, WAIALUA-HALEIWA AREA, Oahu, Hawaii*, Department of the Army, U.S. Army Engineer District, Honolulu, September 1976.
- C *Flood Insurance Rate Map, City and County of Honolulu, Hawaii*, Community Panel Number 150001 0020B and 150001 0040B, Federal Emergency Management Agency, September 4, 1987.
- C *Flood Insurance Study, City and County of Honolulu, Hawaii*, Volumes 1-4, Federal Emergency Management Agency, September 30, 1995.
- C *Annual Report to the Twentieth Legislature Regular Session of 1998, North Shore Paukauila Streambank Erosion and Riparian Area Community Project*, Department of Land and Natural Resources, December 1997
- C *Annual Report to the Twentieth Legislature Regular Session of 1999, North Shore Paukauila Streambank Erosion and Riparian Area Community Project*, Department of Land and Natural Resources, December 1998
- C *Flood Plain Analysis of Proposed Stream Dredging at Paukauila Stream, Island of Oahu*, U.S. Army Corps of Engineers, November 1999.
- *Flood Plain Analysis of Kaukonahua Stream, Island of Oahu*, U.S. Army Corps of Engineers, October 2002.

SENATE CONCURRENT RESOLUTION

REQUESTING A REVIEW OF THE NORTH SHORE PAUKAUILA STREAMBANK AND
RIPARIAN AREA COMMUNITY RESTORATION PROJECT.

1 WHEREAS, Paukauila stream, which is formed by the
2 convergence of the Helemano and Opaepa streams on the North
3 Shore of Oahu and which leads directly into the Kaiaka Bay, is
4 owned by Kamehameha Schools Bishop Estate and various other
5 parties; and

6
7 WHEREAS, the City and County of Honolulu, the Department
8 of Land and Natural Resources Division of Water and Land
9 Development Flood Control Office, and the United States Army
10 Corps of Engineers all have respective jurisdictional
11 responsibilities and commitments to maintain the drainageway
12 and provide for the general welfare and safety of the Paukauila
13 stream area residents; and

14
15 WHEREAS, the areas adjacent to Paukauila stream have
16 been urbanized and developed; and

17
18 WHEREAS, Paukauila stream is classified as a Class II
19 in-land freshwater body, which means that these waters shall
20 not act as receiving waters for any discharges which have not
21 received the best degree of treatment or control; and Kaiaka
22 Bay is the receiving water body of the Paukauila stream
23 drainage area and has been designated by the Department of
24 Health as a Water Quality Limited Segment, meaning that it
25 continually exceeds state water quality standards due to
26 excessive loading of sediment, nutrients, and microbial
27 pathogens; and

28
29 WHEREAS, Kaiaka Bay serves as a critical habitat for
30 endangered marine species and has been shown to contain rich
31 and diverse coralline and microalgae species diversity that
32 are vulnerable to the impacts to streambank erosion; and

33
34 WHEREAS, if the problem is unresolved the community will
35 face undue economic and social hardship, continued threats to
36 life, and the water quality of the estuarine and marine habitat
37 of Paukauila stream and Kaiaka Bay will be allowed to further
38 degrade; and
39

APPENDIX A

1 WHEREAS, the community, landowners, and county, state,
2 and federal agencies have shown great interest in undertaking
3 streambank restoration activities through the newly formed
4 Paukaula Streambank and Riparian Area Community Restoration
5 Project (PSP) which will coordinate such moneys as necessary;
6 and

7
8 WHEREAS, the restoration and maintenance of the
9 Paukaula streambank by the PSP will have a substantial,
10 favorable impact on the North Shore Community and the general
11 public, will preserve and can markedly improve the general
12 health of the stream and the recreational uses of the stream
13 and bay, and will prevent further degradation of Hawaii's
14 freshwater and coastal environments; now, therefore,

15
16 BE IT RESOLVED by the Senate of the Eighteenth
17 Legislature of the State of Hawaii, Regular Session of 1995,
18 the House of Representatives concurring, that the Department of
19 Land and Natural Resources Flood Control Branch in coordination
with interested North Shore Community Associations, is
respectfully requested to assist the PSP by providing
22 information, expertise, and support; and
23

24 BE IT FURTHER RESOLVED that the City and County of
25 Honolulu Department of Public Works, the Department of Land and
26 Natural Resources Division of Water and Land Development Flood
27 Control Office, the Department of Health Environmental Planning
28 Office and Clean Water Branch, the United States Army Corps of
29 Engineers, and the United States Department of Agriculture,
30 Natural Resource Conservation Service in conjunction with the
31 West Oahu Soil and Water Conservation District are requested to
32 coordinate efforts to conduct a review and assessment of the
33 PSP problem to prepare and present a report detailing short
34 term and long term remedial actions to correct the problem; and
35 are requested to work with the PSP Ad-hoc Committee to
36 recommend a restoration plan and assist the various government
37 agencies in the implementation of the recommendation; and
38

39 BE IT FURTHER RESOLVED that the Department of Land and
40 Natural Resources Division of Water and Land Development Flood
41 Control Office and supporting government agencies are requested
42 to report their findings and accomplishments to the Legislature
43 on a yearly basis, no later than twenty days before the
convening of each Regular Session; and

1 BE IT FURTHER RESOLVED that certified copies of this
2 Concurrent Resolution be transmitted to the Governor, the City
3 and County of Honolulu Director and Chief Engineer of the
4 Department of Public Works, the Director of Health and the
5 Chairperson of the Board of Land and Natural Resources, the
6 Branch Chief of the Corps of Engineers United States Army,
7 Department of Defense, the Commanding General of the 25th
8 Infantry Division (Light), the State Conservationist of the
9 Natural Resources Conservation Service of the United States
10 Department of Agriculture, the Chairperson of the North Shore
11 Neighborhood Board of the City and County of Honolulu Office of
12 Neighborhood Commission Office, and the Chairperson of the
13 Kaiaka-Waialua Bay Hydrologic Unit Area Local Advisory
14 Committee, and the members of Hawaii's congressional
15 delegation.